

CRASH

Frequently Asked Questions

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Frequently Asked Questions

Q1.	How will teams be formed?
A1.	Teams are expected to be fluid and informal. Based on the technologies proposed and selected during source selection, and discussions at PI meetings, we expect natural groupings of researchers to emerge around common interests and needs.
Q2.	Is it possible that some performers will not be part of any teams?
A2.	Yes.
Q3.	Who is responsible for architecting, integrating, and testing complete systems from individual projects and where will this be done?
A3.	This will be done by the program as a whole under the leadership of the PM.
Q4.	How should individual proposals account for and address system architecture, integration, and testing activities?
A4.	You should make your best guess about what this will cost in include it in the proposal.
Q5.	Will CRASH consider distributed systems proposals, or is it limited to single-machine systems?
A5.	The focus is single host architectures.
Q6.	How do you reconcile CRASH's key metric of Sustaining Mission Effectiveness – where a mission will require multiple cooperating hosts, some of which may fail – with CRASH's focus on single host architectures?
A6.	There may be another program that will address these issues at the enterprise scale. However, CRASH is focused on the individual host. The metric makes sense for an individual host that has been given a set of tasks to accomplish.
Q7.	Are embedded computing systems (in context of cyber physical systems) in scope for the CRASH program?
A7.	CRASH is focused on the core design principles, not the target domain. To keep the challenge of the program manageable we're not focusing on particular problems that might arise in cyber physical systems, though neither are these excluded.
Q8.	How loosely is the term "host" to be construed? Would a system that used networking protocols such as IP to connect components inside a system count as a single host?
A8.	CRASH is about core technologies that would make <i>any</i> host more secure, adaptive and resilient. The term "host" is intended to mean any computer that acts as a single entity. So, while a non-traditional system that uses datagrams for communication between components seems to qualify as a "host", solutions that depend on the particular interconnect scheme are less likely to be of central concern to the program than would solutions that apply to many different such schemes. CRASH's goal is to develop architectures that illustrate the principles of how to construct secure, adaptive and resilient computers; not to develop new interconnects, unless they are critical to that core goal.

Q9.	DARPA's Self-Regenerative Systems (SRS) program investigated systems that learned from previous attacks, adapted to better cope with future attacks, and repaired themselves automatically. Which results from SRS would and would not be relevant to CRASH?
A9.	The results of SRS are all potentially relevant. What CRASH offers is the opportunity to co-design adaptive techniques along with the OS and hardware in order to gain better security and resilience than would be obtained by working on them separately.
Q10.	Are Adaptive Immunity techniques implemented at the hardware level in scope?
A10.	Yes.
Q11.	Are new processors really in scope given the time and costs associated with development?
A11.	Yes, but not everything need be new. Using the tagged processor from the Proposers' Day briefing as example, the main data path could be standard while only the tag path would be new. The BAA emphasizes minimizing the cost of processor design elements (e.g. novel instruction set design, complex pipelining) that aren't key to the CRASH mission.
Q12.	Are new computational environments that change the development process (e.g., hardware architecture that adapts to the application) in scope?
A12.	Yes, as long as the focus is on security and resilience during and after attack.
Q13.	Are proposers restricted to the Innate/Adaptive/Diversity structure or can other classes of techniques be proposed?
A13.	The immune system analogies are provided to explain the motivation behind the program but the program is not biological in nature or focus. Per the BAA, proposals must specify which of the six specified <i>technical areas</i> their proposal addresses.
Q14.	Is proposing to address backwards compatibility a negative?
A14.	No.
Q15.	How does networking fit into the program if the focus is single host machines?
A15.	The host will need to talk to the network, at least for testing purposes. However CRASH is not about clean design of a new secure network and we do not want to incur the costs of building novel network stacks for CRASH. A possible approach, at least initially, is to have the CRASH host work with a co-processor that runs some conventional software including a network stack in order to programmatically isolate the network.
Q16.	Should proposals assume all malware originates from the network or should they also consider threats from physical access and supply chains?
A16.	We will focus initially on network based attacks. The other issues might come up but aren't considered to be central issues for the CRASH program.
Q17.	Should proposals include an adversarial/red team component as part of their effort?

A17.	No. A “Voice of the Opposition” red team is planned for the program as a separate activity. No decision has been made regarding who will perform that function.
Q18.	Would a proposal for new anti-virus software that identifies and cleans polymorphic malware be in scope for this program?
A18.	While it is not at the center of the program, it would not be out of scope.
Q19.	Does a proposal need to address all technical areas or is a subset acceptable? Are there advantages to proposing some level of integration versus proposing a single idea?
A19.	Per the BAA, “Individual proposals need not cover all technical areas [...] Integrated teams should be considered only when they reflect clear synergies between technical areas and participants, not just to achieve complete coverage of the technical areas.”
Q20.	How should proposals account for situations in which they will be dependent on capabilities developed by others to enable their proposed work (e.g., hardware and programming languages needed before a new OS)?
A20.	The program will proceed as a “co-design” effort. Proposals should identify such dependencies and also identify the types of solutions they would expect to see from other projects in the program. It would also be useful to identify initial bootstrap or work-around techniques that allow experimentation and development while waiting for results from other projects.
Q21.	If proposing to more than one technical area, do page limits for any sections change?
A21.	No.
Q22.	Can classifications innate immunity, adaptive immunity, and diversity be used instead of or in addition to technical areas on the coversheet of the proposal?
A22.	If this helps clarify who might be a good reviewer then include it. However, also include the Technical Areas.
Q23.	Would proposals for less than the full 4 years be responsive?
A23.	They could be. They would need to fit into the first integration point.
Q24.	When submitting a proposal involving a university and a commercial entity, should the two parties submit as co-prime or does DARPA require one to be a prime and the other a sub? If it's the latter, when is it preferable for the university to be the prime (sub)?
A24.	Proposals will be evaluated independently; if you want the university and commercial proposals evaluated together you should submit them as a single proposal. One organization must be the prime on each proposal and the government has no preference for whether that is the university or commercial entity.
Q25.	Can DOE National Laboratories and FFRDCs propose?
A25.	See section III.A of the BAA.
Q26.	Is cost sharing desirable?
A26.	See section III.B of the BAA.

Q27.	What are the upper and lower bounds of reasonable budgets for proposals?
A27.	The program allows for a broad range of projects and there are really no preset lower or upper limits. Projects in similar DARPA programs have had yearly budgets ranging from \$300K to \$6M.
Q28.	How can co-design and teams formed by the government succeed in the presence of intellectual property claims by individual performers?
A28.	Per the BAA, “All technical data or computer software that will be developed or delivered under this program is desired to be furnished to the Government with at least Government Purpose Rights” and “All performers will have an Associate Contractor Agreement clause included in the award to facilitate the open exchange of information.” The government’s purpose in doing this is to encourage the sort of sharing necessary for performers and teams to succeed.
Q29.	Are there restrictions on foreign universities or companies participating as Primes or Subcontractors?
A29.	Per the BAA, “Foreign participants and/or individuals may participate to the extent that such participants comply with any necessary Non-Disclosure Agreements, Security Regulations, Export Control Laws, and other governing statutes applicable under the circumstances.”
Q30.	How important is the goal of “<1% area overhead” that is found in the Proposers’ Day briefing?
A30.	It’s not important. It was just an example of a low overhead solution. Other dimensions of “low overhead” include energy and performance hits. Overhead is a less important goal for this stage of CRASH research than is getting the core design ideas right.
Q31.	Since Adaptive software and Diversity tend to increase complexity and associated management costs, what tradeoffs between manageability and securability are acceptable?
A31.	An ideal solution would minimize both. The more the system is self-aware the more it could help in its own management.
Q32.	What technology is intended when the BAA says “regular teleconference meetings are encouraged?”
A32.	Whatever works for the selected performers. We are not suggesting expensive video teleconferencing systems.
Q33.	What is the relation between CRASH and IARPA’s STONESOUP program?
A33.	They share many technical areas of concern. But STONESOUP is about safely downloading software (of unknown provenance) into existing systems. CRASH is about clean-slate design of new systems that would have inherent protection capabilities.
Q34.	While the cost volume checklist on p. 35 of the BAA references cost buildups “by phase,” there is no reference to program phases in the BAA or in the detailed cost breakdown instructions on p.23. What sort of phase buildup should be used?

A34.	The Detailed Cost Breakdown instructions on p. 23 of the BAA take precedence. There is no additional requirement to provide cost buildups by phase.
Q35.	Our university would like to submit a grant proposal. Can we do that at Grants.gov?
A35.	No. The government does not intend to award grants as part of the CRASH program. You can submit proposals for cooperative agreements at Grants.gov.
Q36.	Do we need to include detailed subcontract cost data with our proposal or can we provide that during contract negotiation if our proposal is selected for funding?
A36.	DARPA strongly encourages detailed subcontract cost data be submitted with your proposal. Otherwise, your proposal may not be suitable for negotiations if you were to be selected for possible award. Proprietary subcontractor cost proposal documentation may be submitted under separate cover.
Q37.	Is work that overcomes the qualitative performance penalties associated with current work on adopting safe language technology in systems codes, while simultaneously advancing the other objectives of the solicitation, of interest?
A37.	While performance is not a focus of the CRASH program, a research direction that addresses one or more of the core technical areas AND performs qualitatively better than other solutions would be both novel and interesting.